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ALASKA PENINSULA MANAGEMENT AREA CHUM SALMON

by

Arnold R. Shaul

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INTRODUCTION

This report provides the magnitude and timing of Alaska Peninsula Management Area chum salmon escapements and harvests. Due to controversy regarding possible post June interception of Arctic-Yukon-Kuskokwim Region chum salmon along the South Peninsula, more detail is shown there than for the North Peninsula. The number of Alaska Peninsula Area chum salmon harvested in the June fisheries likely varies from year to year and will not be discussed in this report.

STREAMS AND ESCAPEMENT

The Alaska Peninsula Management Area is a major producer of chum salmon. There are at least 72 chum salmon producing systems along the Alaska Peninsula's south (Pacific) side (Appendix A.1) and 52 chum systems on the north (Bering Sea) side (Figure 1; Appendix A.2). These systems range in importance from minor streams having escapements of only one hundred fish to systems such as the Canoe Bay River located at Pavlof Bay on the South Peninsula and the Joshua Green River located at Moffet Lagoon on the North Peninsula, which have estimated escapements of 90,000 and 116,000 chum salmon respectively. Large portions, in some cases the entire length, of streams in the Alaska Peninsula Area contain spawnable gravel. The winter temperatures are often relatively mild on the Alaska Peninsula which improves the chances for egg survival.

Table 1 lists the ten streams on each side of the Alaska Peninsula with the highest average chum salmon indexed total escapements during 1986-1995. The systems in Table 1 accounted for at least 69 percent of the South Peninsula and 73 percent North Peninsula chum salmon escapements during 1986-1995.

Indexed total escapements are calculated by adding aerial survey estimates that are about three weeks apart. This is based on the assumption that chum salmon observed during earlier surveys should be spawned out and dead two to three weeks later. If survey estimates for stream A are 2,000 chums on July 10, 10,000 on August 1 and 5,000 on August 22, the indexed total escapement for stream A would be 17,000. Because indexed total escapements take into account escapement throughout the season, they tend to be higher than peak estimates. However, indexed totals are considered to be conservative and do not represent the actual total escapement because there are often no surveys beyond the peak escapement count.

The indexed total escapement goal range for the South and North Peninsula are approximately 350,000 to 700,000 each. Although some of the North Peninsula streams are considerably larger than those on the south side, unstable substrate, common on the north side, limits chum salmon production.

The 1986-95 average South Peninsula indexed total chum salmon escapement was 496,000 fish ranging from 311,000 in 1989 to 727,000 in 1995 (Table 2). The escapement in the Stepovak Flats Section of the Southeastern District is underestimated due to turbid water. Stepovak Flats

is one of the major South Peninsula production areas. The North Peninsula ten year average was 399,000 chums and ranged from 212,000 in 1989 to 756,000 in 1995 (Table 3). In some years, North Peninsula chum salmon are not exploited to their potential due to marketing problems, fish quality, and large pink salmon runs drawing effort to the South Peninsula and Aleutian Islands. The 1995 North Peninsula chum salmon run was abnormally late and peaked after the seine fleet was targeting south side pink salmon. There never has been a directed harvest on Port Heiden and Cinder River chum salmon which accounted for eight percent of the 1986-95 North Peninsula escapement.

TIMING OF ESCAPEMENTS

Tables 4 and 5 list average chum salmon run timing in selected streams along the South Peninsula and North Peninsula respectively. Some important streams were not listed due to water conditions causing data to be incomplete.

The average detection time is later than the first entrance into the stream since surveys are usually not conducted at the exact time chums enter fresh water. There is a large variation in escapement timing between streams. For example, the escapement timing of Volcano River is about a month later than that of Canoe Bay River (Table 4). The average date of first detection at Warm Springs is 49 days later than that of St. Catherine Cove even though both systems are located at Bechevin Bay (Table 5) (Figure 2).

Chum salmon may remain in saltwater near their home stream for up to three weeks before entering freshwater (Salo, 1991). ADF&G biologists in the South Peninsula have noticed similar milling behavior by chum salmon in terminal waters, closed to commercial fishing, during stream surveys. Consequently, a chum salmon entering Volcano River on August 22 may have passed through the Shumagin Islands (or other distant South Peninsula cape area) between July 30 and August 12, allowing three days travel time, and one to three weeks milling in Volcano Bay. A chum salmon entering Canoe Bay River on July 23 may have passed through the Shumagin Islands between June 29 and July 13. The 1987 June tagging study indicated that there was about a 20 day delay from the time chum salmon were tagged in the South Unimak and Shumagin Islands until they were recaptured in the South Peninsula post June fishery (Eggers, 1991). Tagging done on July 6, 1923 in the Shumagin Islands indicated that there was approximately a 12-day delay from the time chum salmon were tagged until they were recaptured in Pavlof and Volcano Bays. It is not known how much time the above fish spent enroute and what was spent near the stream mouths. The actual time spent in saltwater after passing a cape fishery location, before arriving at a terminal bay, may be more than the three days used above.

HARVESTS

The South Peninsula post June chum salmon harvest averaged 992,000 fish during 1986-95 (Table 2) while the average season North Peninsula chum harvest was 217,000 for the same period (Tables 2 and 3).

Table 6 lists the average South Peninsula chum salmon harvest by week. A ten year (1986-1995) average was used after July 18 while only a seven year (1986-1992) average was used for early July. After 1992 most of the South Peninsula has been closed to commercial salmon fishing during early July making post 1992 harvests uncomparable to earlier years. The peak South Peninsula chum salmon harvest occurs between July 26 and August 8.

The average South Peninsula chum salmon harvest during July 5-19 declined by approximately 172,000 fish from 1986-1992 to 1993-1995 (Table 7). The Shumagin Islands and South Unimak fisheries (Unimak and Ikatan Bay Section of the Southwestern District) were the locations where most of the decline occurred.

Table 8 and Figure 3 list the 1986-1995 average indexed total escapements and harvests by district. The harvests in relation to the escapement is greater in the Unimak and Southeastern Districts than in the other districts. At times large numbers of small chum salmon have been caught in the Unimak District during early July. These catches are reflected in the 1988-1990 harvests. Suspecting that some of these Unimak District fish were immature, the department curtailed fishing in the Unimak District by emergency order when large numbers of small chum salmon appeared in the catch. Many of the chum salmon caught in the Shumagin Islands Section of the Southeastern District are likely headed for the South Central and Southwestern Districts based on tagging done by Gilbert and Rich in 1923 (Appendix A.3) and the proximity of districts to the Shumagin Islands. The southeastern District escapement is also underestimated due to turbid water conditions in the Stepovak Flats Section, a major chum salmon producing location.

SUMMARY

The Alaska Peninsula Area is a major producer of chum salmon. Indexed total escapements of chum salmon have averaged 496,000 and 399,000 for the south and north sides of the Alaska Peninsula Area respectively during 1986-1995. Ten streams on each side account for roughly 70 percent of the escapement for their respective side of the Alaska Peninsula Area. There is considerable variation in run timing between streams. Chum salmon begin entering South Peninsula streams as early as July 7 and peak escapement dates by South Peninsula stream range from August 10 until September 12. There can be a considerable length of time between when a chum salmon passes a cape fishery and when it enters a local stream.

The 1986-1995 average South Peninsula post June harvest was 992,000 chum salmon. The peak South Peninsula post June harvest occurs from July 26 through August 8. North Peninsula chum salmon are underexploited during some years, averaging a 217,000 harvest during 1986-1995.

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Table 1. Largest Chum salmon producing streams located in the Alaska Peninsula/Aleutian Islands Management Area, based on the average indexed total chum salmon escapement, 1986-95[a].

Stream	Stream Number	District	Escapement
SOUTH PENINSULA			
1. Canoe Bay River	283-64.06	South Central	90,000
2. Russel Creek	284-34.02	Southwestern	72,500
3. Belkofski River	284-42.07	Southwestern	49,200
4. Sandy Cove	284-20.01	Southwestern	29,100
5. Stepovak River[b]	281-33.05	Southeastern	28,000
6. Volcano River	284-52.08	Southwestern	23,200
7. Volcano Center	284-52.07	Southwestern	20,100
8. Delta Creek	284-34.10	Southwestern	11,100
9. Ramsey Bay[b]	281-33.01 ,2	Southeastern	10,200
10. Little John Lagoon	284-12.13	Southwestern	9,800
Total			**343,200**
NORTH PENINSULA			
1. Joshua Green River	312-40.01	Northwestern	115,500
2. Lawrence Valley Cr.	314-20.07	Northern	37,800
3. Grass Valley Creek	324-22.06	Northern	27,800
4. Meshik River	317-20.07 A	Northern	25,400
5. Frosty Creek	312-20.05	Northwestern	19,500
6. Moffet Springs Cr.	312-40.02	Northwestern	17,500
7. St. Catherine Cove	311-60.01	Northwestern	13,600
8. Traders Cove	311-60.07 ,8	Northwestern	13,400
9. Moffet Creek	312-40.03	Northwestern	12,100
10. Alligator Hole	312-20.03	Northwestern	10,700
Total			**293,300**

[a] Escapement counts are based on aerial surveys.

[b] The escapement estimates into the Stepovak River, Ramsey Bay Creek and other streams in the Stepovak Flats Section of the Southeastern District are low due to turbid water in large portions of the systems.

Table 2. South Peninsula indexed total chum salmon escapements and post June harvests, 1986-1995[a].

Year	Indexed Total Chum Salmon Escapement	Post June Chum Salmon Harvest	Total	Ratio Catch to Escapement
1986	545,000	1,394,000	1,939,000	2.6:1
1987	620,000	930,000	1,551,000	1.5:1
1988	496,000	1,382,000	1,878,000	1.8:1
1989	311,000	538,000	849,000	1.7:1
1990	355,000	716,000	1,071,000	2.0:1
1991	588,000	798,000	1,386,000	1.4:1
1992	335,000	880,000	1,216,000	2.6:1
1993	398,000	514,000	911,000	1.3:1
1994	580,000	1,594,000	2,183,000	2.7:1
1995	727,000	1,173,000	1,899,000	1.6:1
Average	496,000	992,000	1,488,000	2.0:1

[a] Rounded off to nearest thousand.

Table 3. North Peninsula indexed total chum salmon escapements and harvests, 1986-1995[a].

Year	Indexed Total Escapement	Chum Salmon Harvest	Total	Ratio Catch to Escapement
1986	244,000	271,000	515,000	1.1
1987	511,000	369,000	880,000	0.7
1988	500,000	393,000	893,000	0.8
1989	212,000	157,000	369,000	0.7
1990	226,000	126,000	352,000	0.6
1991	303,000	191,000	494,000	0.6
1992	352,000	342,000	694,000	1.0
1993	402,000	135,000	537,000	0.3
1994	480,000	84,000	564,000	0.2
1995	756,000	99,000	855,000	0.1
Average	399,000	217,000	616,000	0.6

[a] Rounded off to nearest thousand.

Table 4. South Peninsula chum salmon escapement timing[a].

Stream	Stream Number	District	Average First Detection In Stream	Average Peak Estimate In Stream
Grub Gulch Creek	281-32.07	Southeastern	August 9	August 31
Coleman Creek	281-80.15	Southeastern	August 9	September 5
Lefthand River	281-80.08	Southeastern	August 4	August 22
Beaver River	281-70.05	Southeastern	July 24	August 17
Zachary Bay	282-12.05	Southeastern	July 29	August 9
Bay Point Creek	282-13.03	Southeastern	July 29	August 14
Canoe Bay River	283-64.06	South Central	July 7	August 10
Volcano River	284-52.08	Southwestern	August 7	September 7
Volcano Center	284-52.07	Southwestern	August 9	September 12
Belkofski River	284-42.07	Southwestern	August 8	September 4
Delta Creek	284-34.10	Southwestern	August 9	August 31
Russel Creek	284-34.02	Southwestern	July 16	August 23
Sandy Cove Creek	284-20.01	Southwestern	August 5	September 2
Little John Lagoon Cr.	284-12.13	Southwestern	August 10	September 2

[a] Escapement counts are based on aerial surveys.

Table 5. North Peninsula chum salmon escapement timing[a].

Stream	Stream Number	District	Average First Detection In Stream	Average Peak Estimate In Stream
Lawrence Valley Cr.	384-20.07	Northern	July 16	August 12
Grass Valley Creek	314-20.06	Northern	July 19	August 12
Moffet Springs Cr.	312-40.02	Northwestern	July 15	August 24
Joshua Green River	312-40.01	Northwestern	July 9	August 29
Frosty Creek	312-20.05	Northwestern	July 11	August 26
Alligator Hole	312-20.03	Northwestern	July 23	August 28
Warm Springs	311-60.12	Northwestern	August 24	September 11
Traders Cove	311-60.07,8	Northwestern	August 10	September 5
St. Catherine Cove	311-60.01	Northwestern	July 6	August 6
Peterson Lagoon	311-30.09,10	Northwestern	July 5	August 6

[a] Escapement counts are based on aerial surveys.

Table 6. Average post June commercial chum salmon harvest in numbers of fish by 1987 statistical week, 1986-95.

Week	Southeastern District		South Central District	South[a] Western District	South Unimak Fishery	Total South Peninsula
	Mainland	Shumagin Islands				
28 July 5-11	3,718[b]	49,228[b]	6,474	7,147[b]	23,282[b]	86,390[b]
29 July 12-18	10,516[b]	59,521[b]	17,396	6,757[b]	7,971[b]	100,401[b]
30 July 19-25	13,640	69,692	40,332	18,804	13,120	146,365
31 July 26-Aug 1	55,227	69,186	34,845	46,452	12,445	208,186
32 August 2-8	43,136	47,728	37,478	70,221	6,146	198,956
33 August 9-15	21,334	24,553	32,007	90,613	2,530	168,650
34 August 16-22	5,493	7,494	7,395	54,343	543	55,872
After August 22	11,876	1,722	803	20,759	110	57,325

[a] The post June South Unimak fishery includes the Unimak District and Ikatan Bay Section of the Southwestern District.

[b] 1986-92 averages. **NOTE:** 1986-92 averages were used in much of the South Peninsula due to early July closure in effect after 1992. This closure made post 1992 data uncomparable to previous data.

Table 7. July 5-19 South Peninsula post June chum salmon harvest, 1986-92 average vs. 1993-95 average (includes Southeastern District Mainland).

Shumagin Islands		South Unimak		Total South Peninsula	
1986-92	1993-95	1986-92	1993-95	1986-92	1993-95
113,368	5,209	32,005	0	198,848	26,707

Table 8. Indexed total chum salmon escapements and post June chum harvests by district, South Peninsula[a].

	Southeastern District		South Central District		Southwestern District		Unimak District	
Year	Escapement	Catch	Escapement	Catch	Escapement	Catch	Escapement	Catch
1986	128,000	723,000	113,000	255,000	304,000	414,000	0	2,000
1987	167,000	552,000	162,000	198,000	291,000	171,000	0	9,000
1988	86,000	674,000	183,000	155,000	226,000	475,000	1,000	78,000
1989	100,000	371,000	90,000	50,000	121,000	67,000	0	50,000
1990	115,000	150,000	96,000	60,000	143,000	102,000	1,000	54,000
1991	181,000	404,000	164,000	157,000	242,000	229,000	1,000	8,000
1992	83,000	335,000	111,000	254,000	141,000	280,000	0	11,000
1993	46,000	187,000	127,000	144,000	224,000	181,000	1,000	2,000
1994	60,000	360,000	152,000	318,000	366,000	905,000	2,000	1,000
1995	138,000	485,000	187,000	177,000	401,000	511,000	1,000	0
Average	110,000	460,000	139,000	177,000	246,000	334,000	1,000	21,000

[a] Rounded off to nearest thousand.

Figure 1. Locations of Alaska Peninsula Area Chum Salmon Systems.

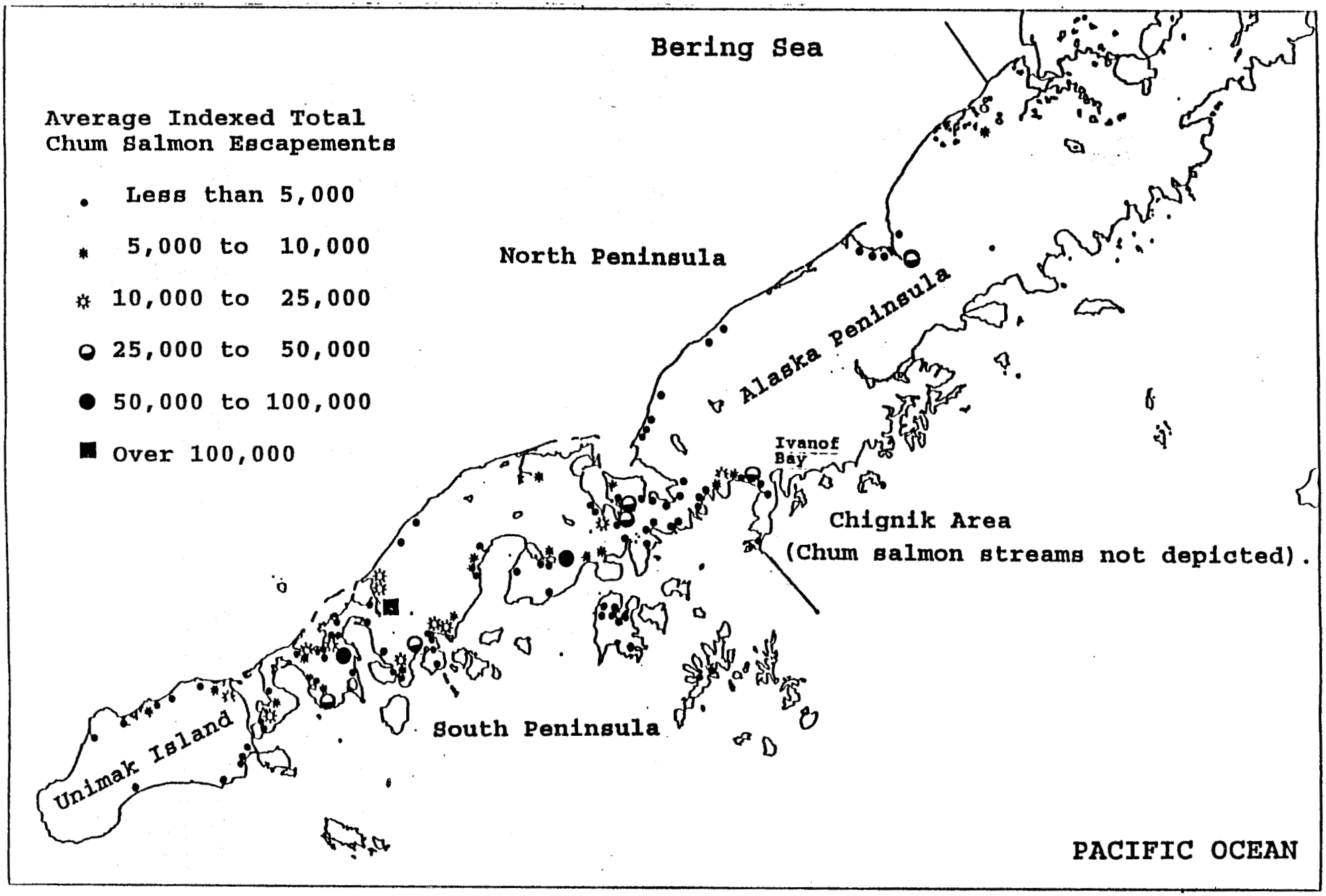


Figure 2. Map of Alaska Peninsula Area With The Locations Of Some of The Bays and Streams Discussed In Text.

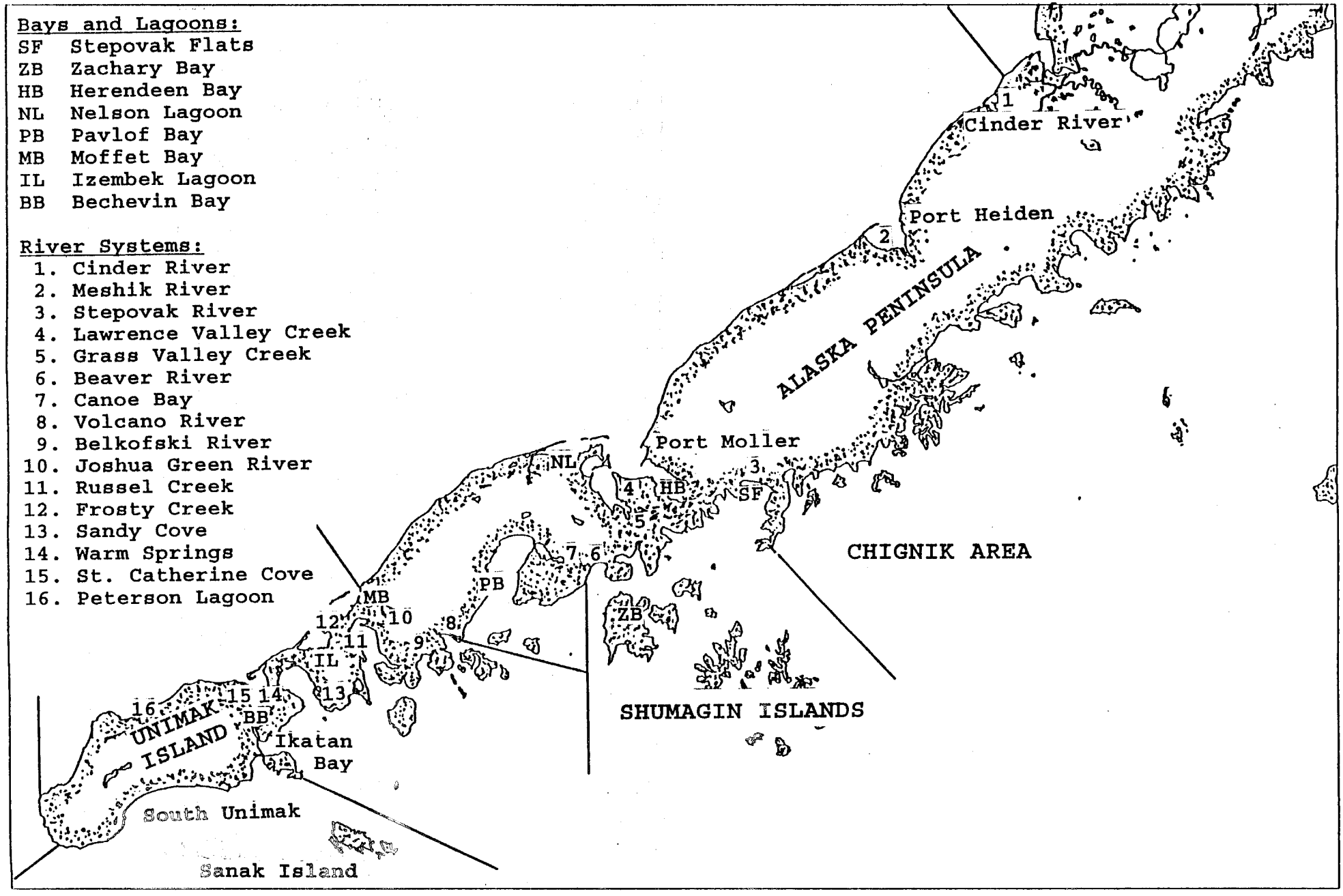
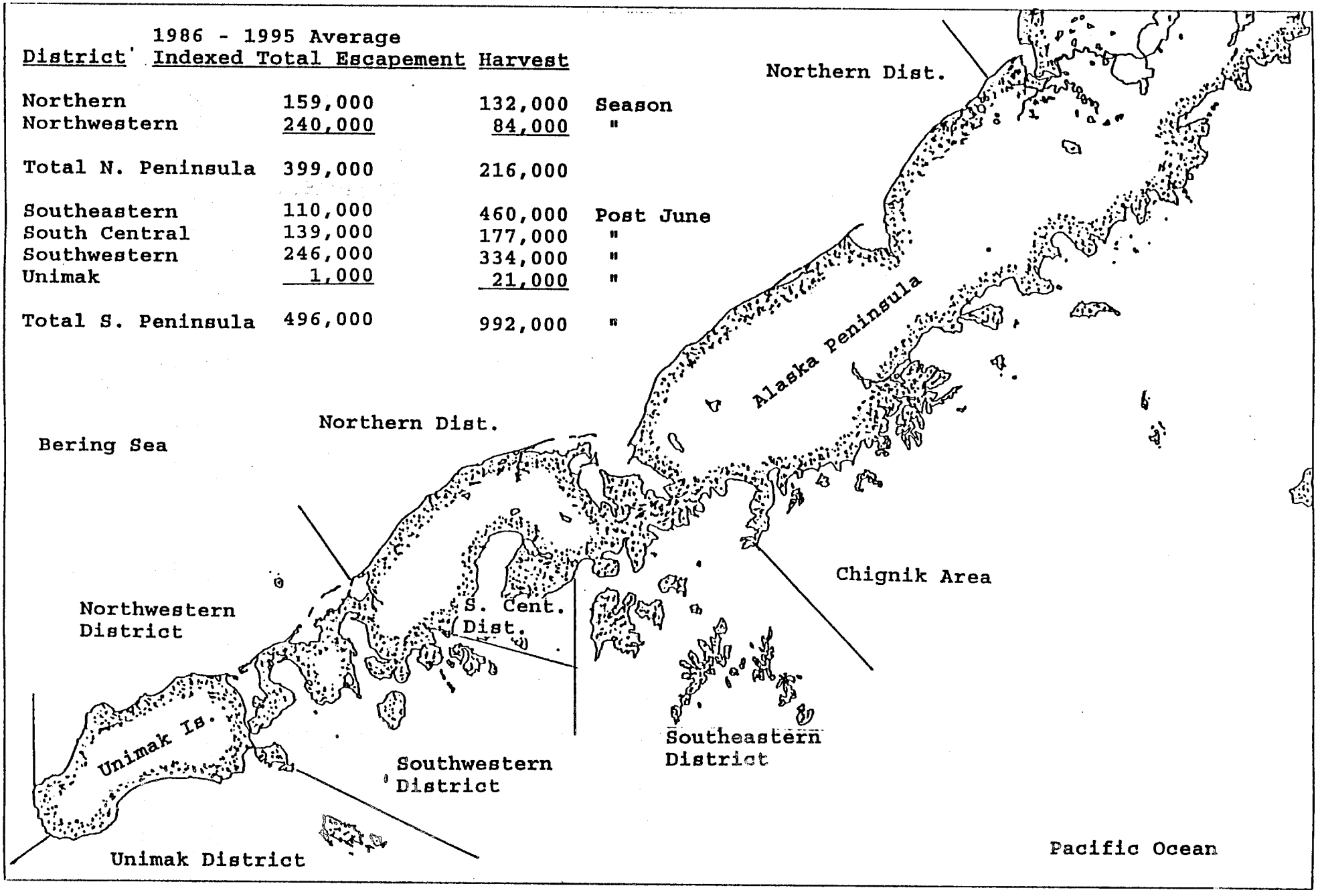


Figure 3. Alaska Peninsula Area Chum Salmon Average Escapement by District.

District	1986 - 1995 Average Indexed Total Escapement	Harvest	
Northern	159,000	132,000	Season
Northwestern	240,000	84,000	"
Total N. Peninsula	399,000	216,000	
Southeastern	110,000	460,000	Post June
South Central	139,000	177,000	"
Southwestern	246,000	334,000	"
Unimak	1,000	21,000	"
Total S. Peninsula	496,000	992,000	"



APPENDIX

Appendix A.1. South Peninsula chum salmon streams and 1986-1995 average indexed total escapements.

	Stream Name or Location	Stream Number	Average Escapement
SOUTHEASTERN DISTRICT			
1.	Boulder Bay	281-35.06	1,700
2.	Fox Bay	281-35.05	400
3.	Fox Bay	281-35.04	200
4.	Granville	281-34.01	2,100
5.	Granville Portage	281-33.06	1,100
6.	Stepovak River	281-33.05	28,000
7.	Big River	281-33.04	4,900
8.	Louie's Corner	281-33.03	8,200
9.	Ramsey Bay	281-33,01&2	10,200
10.	Grub Gulch	281-32.07	7,300
11.	Clark Bay	281-32.05	1,400
12.	Little Norway	281-32.04	2,500
13.	Orzinski	281.31.03	300
14.	Chichagof	281-20,02&3	3,100
15.	Chichagof	281-20.01	100
16.	Dorenoi	281-20.02	200
17.	Dorenoi	281-20.01	800
18.	San Diego	281-90.03&4	4,700
19.	Coleman Creek	281-80.15	8,700
20.	Johnson Creek	281-80.14	3,000
21.	Foster Creek	281-80.09	3,400
22.	Lefthand River	281-80.08	5,200
23.	Beaver River	281-70.05	8,100
24.	Dry Lagoon	282-13.02	2,500
25.	Bay Point	282-13.03	2,900
26.	Delarof Harbor	282-10.11	300
27.	Zachary Bay	282-12.07	100
28.	Zachary Bay	282-12.05	1,500
29.	Zachary Bay	282-12.06	100
30.	Coal Harbor	282-12.01	300
31.	Sanborn Harbor	282-20.03	1,000
32.	Falmouth Harbor	282-20.05	100
SOUTH CENTRAL DISTRICT			
33.	Mino Creek	283-70.01	900
34.	Settlement Point Creek	283-63.16	3,200
35.	Canoe Bay	283-64.09	2,300
36.	Entrance Creek	283-64.08	2,600
37.	Canoe Bay River	283-64.06	90,000
38.	Bluff Point Creek	283-64.05	8,000
39.	Ruby's Lagoon	283-63.13	8,200
40.	Chinaman Lagoon, North	283-63.11	900
41.	Chinaman Lagoon, Center	283-63.10	6,100
42.	Chinaman Lagoon, South	283-63.05&6	5,900
43.	South of Chinaman Lagoon	283-63.04	1,900
44.	Long John Lagoon	283-61.03	100
45.	Long John Lagoon	283-61.02	7,200

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	Stream Name or Location	Stream Number	Average Escapement
SOUTHWESTERN DISTRICT			
46.	Volcano River	284-52.08	23,300
47.	Volcano Center	284-52.07	20,100
48.	Volcano Bay	284.52.06	3,200
49.	Stream Guard Creek	284-52.05	1,400
50.	Bear Bay	284-52.03	8,000
51.	Belkofski Village Creek	284-41.01	300
52.	Captain's Harbor	284-42.09	700
53.	Belkofski River	284-42.07	49,200
54.	Ram's Creek	284-33.05	600
55.	King Cove Lagoon, North	284-33.04	5,800
56.	King Cove Lagoon, West	284-33.03	1,400
57.	Delta Creek	284-34.10	11,100
58.	Barney's Creek	284-34.09	2,600
59.	Kinzarof Lagoon	284-34.07	200
60.	Trout Creek	284-34.03	400
61.	Russel Creek	284-34.02	72,500
62.	Old Man's Lagoon	284-32.01	2,900
63.	Sandy Cove	284-20.01	29,100
64.	Near Egg Island	284-11.01	900
65.	Little John Lagoon	284-12.13	9,800
66.	Little John Spit	284-12.12	500
67.	Cannery Creek	284-12.11	200
68.	Sankin Bay	284-60.06	100
69.	Ikatan River	284-60.04	1,200
UNIMAK DISTRICT			
70.	Otter Cove, East	285-40.09	100
71.	Otter Cove, West	285-40.08	300
72.	Lazeref River	285-40.05	300

Appendix A.2. North Peninsula chum salmon streams and 1986-1995 average indexed total escapements.

	Stream Name or Location	Stream Number	Average Escapement
NORTHWESTERN DISTRICT			
1.	Tugamak River	311.20.15	800
2.	Divide Creek	311-30.06	200
3.	Peterson Lagoon	311-30.09	7,200
4.	Emil's River	311-40.01	400
5.	North Creek	311-40.04	800
6.	Big River 311-50.01	700	
7.	Swanson Lagoon	311-50.02	5,900
8.	St. Catherine Cove	311-60.01	13,600
9.	Anderson's Creek	311-60.02	500
10.	Trader's Cove	311-60.07&8	13,400
11.	Warm Springs	311-60.12	5,500
12.	Hungery's Creek	311-60.13	100
13.	Norma Bay 312-20.01	200	
14.	Alligator Hole	312-20.02	5,100
15.	Alligator Hole	312-20.03	10,700
16.	Alligator Hole	312-20.04	4,500
17.	West of Frosty Creek	312-20.52	3,300
18.	West of Frosty Creek	312-20.51	3,500
19.	Frosty Creek	312-20.50	19,500
20.	Blue Bill 312-20.06	700	
21.	Outer Marker	312-20.13	400
22.	Joshua Green River	312-40.01	115,500
23.	Moffet Springs Creek	312-40.02	17,500
24.	Moffet Creek	312-40.03	12,100
NORTHERN DISTRICT			
25.	North Creek	313-10.02	2,100
26.	Trader Mountain Creek	313-10.06	100
27.	Nelson Lagoon	313-30.03	6,900
28.	Doe Valley 314-20.02	3,400	
29.	Buck Valley	314-20.03	3,400
30.	Deer Valley	314-20.04	10,600
31.	Portage Valley	314-20.05	2,800
32.	Grass Valley	314-20.06	27,300
33.	Lawrence Valley	314-20.07	37,800
34.	Mine Harbor	314-20.08	300
35.	Coal Creek 314-20.09	8,000	
36.	Mud Bay 314-30.04	2,900	
37.	Mud Bay 314-30.05	1,800	
38.	314-30.07	700	
39.	Right Head Creek	314-30.09	3,500
40.	Left Head Creek	314-30.10	3,500
43.	Bear River 315-11.02	500	
44.	Sandy River	315-12.01	700
45.	Lime Creek 316-10.01	100	
46.	316-10.02	100	
47.	Three Hills	316-10.04	200

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	Stream Name or Location	Stream Number	Average Escapement
41.	Frank's Lagoon	315-10.01	2,700
42.	King Salmon River	315-10.02	100
48.	Charles Creek	317-20.02	600
49.	Bluff Creek	317-20.04	1,100
50.	Meshik River	317-20.07	25,400
51.	Birthday Creek	317-20.08	800
52.	Cinder River	318-20.06	7,800

Appendix A.3. Recoveries from chum salmon tagging in Shumagin Islands July 6, 1923.[a,b]

	Recoveries	Percent Recoveries	Median Time In Days
Chums Tagged = 190			
Recoveries Outside Tagging Location = 38			
SOUTH PENINSULA			
Pavlof and Volcano Bays	27	71.1	12.20
Thin Point	3	5.5	26.00
Morzhovoi Bay	4	10.5	17.00
Ikatan-False Pass	2	5.3	7.00
Total South Peninsula	36	94.7	
BRISTOL BAY	1	2.6	33.00
YUKON RIVER	1	2.6	-

[a] Big Valley Trap, Unga Island
[b] Gilbert and Rich 1925